REMARKS

Applicants submit this reply in response to the non-final Office Action mailed April 24, 2007. Before this response, claims 15-36 were pending, of which claims 15 and 29 were independent. By this amendment, Applicants have amended independent claims 15 and 29 and have rewritten allowable claims 21, 28, and 33 into independent form. As a result, claims 15-36 are currently pending, of which claims 15, 21, 28, 29, and 33 are independent.

In the Office Action, the Examiner rejected claims 15, 17-20, 29, 30, and 32 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication 2003/0123827 ("Salerno et al."). Claims 16, 26, 27, 31, 35, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Salerno et al.[1] Finally, the Examiner objected to claims 21-25, 28, 33, and 34 as being dependent on a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form. Applicants respectfully traverse all pending objections and rejections and request reconsideration of the application, as amended.

Independent Claims 15 and 29

Independent claims 15 and 29 were rejected under 35 U.S.C. § 102(e) as being anticipated by Salerno et al. In order to properly establish an anticipation rejection under 35 U.S.C. § 102, every element of the claim at issue must be found in the applied prior-art reference, either expressly or under principles of inherency. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim."

[1] In the Office Action, the heading for the Section 103 rejections of claims 35 and 36 references U.S. Patent No. 6,198,860 ("Johnson et al."). However, Johnson et al. was never relied on in the rejections of these claims. Accordingly, Applicants believe that the reference to Johnson et al. was inadvertent and that claims 35 and 36 stand rejected over Salerno et al.

See M.P.E.P. § 2131, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). In this case, Salerno et al. fails to teach or suggest every element of the Applicants' claimed invention, as presently amended.

Independent claim 15, as amended, calls for a combination including, for example, "a photonic crystal having a regular non-zero periodicity in said optical crossing region, the non-zero periodicity selected so that the first and second optical beams propagating on the first and second axes cross each other in the crossing region and exit the crossing region substantially unchanged along their respective propagation axes." Salerno et al. fails to teach or suggest at least a photonic crystal, as recited in amended independent claim 15.

More specifically, Salerno et al. teaches "systems and methods of manufacturing integrated photonic circuit devices." Salerno et al., Title. For example, Salerno et al. discloses the following types of photonic devices: multi-cavity Fabry-Perot resonators, photonic crystal wavelength routers, and photonic crystal add/drop multiplexers. Id., ¶¶ 0014, 0017, 0018. Each photonic device in Salerno et al. includes input and output waveguides coupled to a photonic crystal filter. Id., ¶ 0013, FIG. 42A (showing waveguides 1342-48 coupled to photonic crystal filter 1354). "[T]he photonic crystal filter includes . . . a photonic crystal resonator system coupled between the input and output waveguides. The resonator is operable for the adjustable transfer of at least one desired frequency to the output waveguide." Id., ¶ 0013. As such, the photonic crystal filter in Salerno et al. adjustably filters frequencies of received optical beams so as to output substantially changed, filtered versions of the optical beams, i.e., having different frequency (or wavelength) components. See, e.g., id., FIG. 42A, ¶ 0183.

Applicants respectfully submit that Salerno et al. fails to teach or suggest at least "the non-zero periodicity selected so that the first and second optical beams propagating on the first and second axes cross each other in the crossing region and exit the crossing region ***substantially unchanged*** along their respective propagation axes," as recited in Applicants' amended independent claim 15. Rather, the photonic crystal filter in Salerno et al. adjustably filters wavelengths from crossing optical beams, thereby substantially changing the wavelength components of those crossing beams. See, e.g., Salerno et al., ¶ 0013 ("The photonic crystal filter is tunable for wavelength and polarization").

For example, the Examiner cites to FIG. 42A in Salerno et al. in which a first optical beam having wavelength components λ1, λ2, . . . λn, enters a tunable photonic crystal filter 1354 from a first optical waveguide 1342 ("INPUT"), and a second optical beam having a wavelength λi' enters the filter 1354 from a second waveguide 1348 ("ADD").[2] Salerno et al. Fig. 42A. However, after the first and second beams cross in the tunable crystal filter 1354, their wavelength components are substantially changed. That is, the photonic crystal filter 1354 functions as an add/drop multiplexer, wherein the first optical beam enters the filter having wavelengths λ1, λ2, . . . λn, and then exits the filter in the same direction, but having only a single wavelength component λi. Id. Similarly, the second optical beam enters the tunable filter 1354 with a single wavelength component λi' and subsequently exits the filter in the same direction, but having multiple wavelength components λ1, . . . λi', λn. Id.

[2] The pending Office Action contains a number of statements reflecting characterizations of the related art and claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Office Action.

Unlike the tunable photonic crystal filter 1354 that is configured to change the wavelength components of crossing optical beams in Salerno et al., Applicants' amended independent claim 15 instead recites first and second beams that "cross each other in the crossing region and exit the crossing region ***substantially unchanged*** along their respective propagation axes." As such, a fair and proper reading of Salerno et al. cannot reasonably teach or suggest at least "a photonic crystal having a regular non-zero periodicity in said optical crossing region, the non-zero periodicity selected so that the first and second optical beams propagating on the first and second axes cross each other in the crossing region and exit the crossing region substantially unchanged along their respective propagation axes," as claimed. For at least this reason, Applicants submit that independent claim 15, as amended, is allowable over the art of record.

Independent claim 29, as amended, calls for a combination including, for example, "feeding to the photonic crystal a first and a second optical beam along a first and a second direction corresponding to said crystal axes, so that said first and second optical beams cross each other in the optical crossing region of said optical crystal and exit the optical crossing region ***substantially unchanged*** along the same first and second directions." As discussed above, the tunable photonic crystal filter 1354 in Salerno et al. changes the wavelength components of first and second beams crossing in the filter. As a result, Salerno et al. fails to teach or suggest at least an optical crossing region, wherein "first and second optical beams cross each other in the optical crossing region of said optical crystal and exit the optical crossing region substantially unchanged along the same first and second directions," as recited in amended claim 29.

For at least this reason, Applicants submit that the Section 102 rejection of independent claim 29 should be removed.

Dependent Claims 16-20, 26, 27, 30-32, 35, and 36

Claims 16-20, 26, 27, 30-32, 35, and 36 depend on independent claims 15 and 29 and are therefore allowable for at least the same reasons.

Allowable Claims 21-25, 28, 33, and 34

The Examiner objected to dependent claims 21-25, 28, 33, and 34 as being dependent on a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form. In response, Applicants have rewritten the objected-to claims 21, 28, and 33 into independent form, thereby placing these claims in condition for allowance. Claims 22-25 and 34 depend on allowable independent claims 21 or 33 and are therefore allowable for at least the same reasons.

Conclusion

The preceding reasoning is based only on the arguments in the Office Action, and therefore does not address other features of the claims that were not addressed by the Examiner in the Office Action. The claims may include other elements that are not shown, taught, or suggested by the cited art. Accordingly, the preceding reasoning is advanced without prejudice to other possible bases of patentability.

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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By: _____

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